

**REMARKS**

Reconsideration and allowance of the subject application are respectfully requested. Claims 1-6 and 8-27 remain pending, claims 1, 20, 22-25, and 27 being independent claims. In this Reply, Applicants have amended claims 1, 4, 20, 22-25, and 27 and canceled claim 7 without prejudice or disclaimer.

**Claim Objections**

In reply to the objection to the claims based on gaps between consecutive claims, Applicants have resubmitted claims 18-27, which contained the gaps noted by the Examiner. Accordingly, Applicants respectfully request that the objection to the claims be withdrawn.

**Rejections Under 35 U.S.C. § 112, Second Paragraph**

Claims 4-6 and 22 stand rejected under 35 U.S.C. § 112, second paragraph. This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Regarding claims 4-6, which the Examiner asserts are indefinite based on the recitation of “a processor” in line 2 of claim 4, Applicants have amended the phrase “a processor” to read --said processor--, referring back to the processor of base claim 1.

Regarding claim 22, which the Examiner asserts is incomplete, Applicants have amended claim 22 to explicitly recite the step of “accessing graphical information to be printed on the surface.” Applicants submit that this amendment fully addresses the issue raised by the Examiner on page 2 of the Office Action regarding claim 22.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, second paragraph.

**Prior Art Rejections**1. § 102 Rejection Based on Yamada/§ 103 Rejection Based on Yamada - Sekendur

Claims 1-6, 8, 9, 14, 16-18, 22-24, and 27 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Yamada* (U.S. Patent 5,927,872). Claims 7, 10, 12, 13, 20, and 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over *Yamada* in view of *Sekendur* (U.S. Patent 5,852,434). These rejections, insofar as they pertain to the presently pending claims, are respectfully traversed.

Independent claim 1 is directed to an apparatus for printing graphical information on a surface. The apparatus of claim 1 comprises: a print head for printing indicia on the surface; an image sensor for recording an image of the surface, wherein the recorded image contains a position-coding pattern that identifies a position on the surface; and a processor for converting the recorded image into a recorded position. As amended in this Reply, claim 1 specifies that the recorded position is defined by two coordinate values. The print head prints indicia on the surface based on a comparison of the recorded position with the graphical information to be printed.

An object of the present invention is to provide a small, hand-held printer that is insensitive to the printer being lifted from the surface and that is insensitive to the position in which the printing is started. According to the invention, the surface on which the printer is to print is provided with an absolute position-coding pattern. This pattern is arranged to code the absolute coordinates for a position, which means that the printer can determine its position by registering a portion of the surface. The printer prints in positions that correspond to positions in the graphical information that are to be printed. As the position is determined by transformation of a position coordinate, the image sensor of the printer

only has to record a small portion of the surface to know its absolute position. Thus, no prior knowledge of earlier movement of the printer is necessary and no correlations between pictures are required. This makes the position determination fast and reliable.

Claim 1 has been amended herein to include the features of dependent claim 7, which the Examiner admits are not taught by *Yamada*. Independent claims 22-24 and 27 have been similarly amended. Accordingly, Applicants submit that the rejection of claims under 35 U.S.C. § 102 has at least been overcome by the claim amendments presented herein. For purposes of this Reply, Applicants address the patentability of all independent claims over the asserted modification of *Yamada* in view of *Sekendur*, which, as stated on page 5 of the Office Action, the Examiner relies on as allegedly teaching the incremental features of dependent claim 7 and other dependent claims.

*Yamada* discloses a system and a method for printing information. The printer 10 described by *Yamada* is hand-held and, as illustrated for example in Fig. 4, includes a plurality of navigation sensors 30 to track movement of the printer 10 relative to a print medium during a printing process. As illustrated in Fig. 5 (discussed at col. 5, line 59 – col. 6, line 40), the hand-held printer 10 of *Yamada* compares successively generated images to determine relative position. By comparing images of the surface to be printed, captured at different times, the movement of the hand-held printer 10 can be determined. The hand-held printer 10 of *Yamada* starts to print in a position where it is initiated to start printing. When the printer 10 is moved over the surface, it determines its position based on a comparison of a captured image with a previously captured image and a previously determined position. Pattern variations on the print medium, such as paper fibers or highly reflective surface portions, may be detected to aid tracking. Col. 9, lines 52-54.

Recognizing that *Yamada* fails to disclose an apparatus for printing graphical information on a surface as now recited in claim 1, the Examiner states on page 5 of the Office Action that the secondary reference, *Sekendur*, makes up for this deficiency, and asserts that:

It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the recorded position of *Yamada* to define plural coordinates to determine the speed and direction of the printing element as taught by *Sekendur*.

The motivation for doing so would have been to avoid tracking errors by accurately determining the position and movement of the printing element as taught by column 2, lines 59-63 of *Sekendur*.

At least based on the following, Applicants respectfully submit that this reasoning fails to establish *prima facie* obviousness of any pending claim.

To establish *prima facie* obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of prior art must be supported by some teaching, suggestion, or motivation in the applied reference or in knowledge generally available to one skilled in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a *prima facie* case of obviousness. *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); *In re Ehrreich*, 590 F.2d 902, 908-09, 200 USPQ 504, 510 (CCPA 1979).

In this case, Applicants note that *Sekendur* describes a device for indicating the instantaneous position and movement of a stylus on a surface, and makes no mention or suggestion of applying its position detecting technique to printing, in the manner required by claim 1 of this application. Applicants find no suggestion in either reference, or in knowledge generally available to those skilled in the art, to modify the relative-position based printing system of *Yamada* in the manner asserted by the Examiner on page 5 of the Office Action. Furthermore, it is important to recognize that nearly the entire disclosure of *Yamada* appears to be directed to improving performance of relative tracking of printer movement. Thus, modifying the hand-held printer 10 of *Yamada* in the manner asserted by the Examiner would change the principle of operation of the printer disclosed therein. As specified in MPEP § 2143.01, the teachings of references is insufficient to establish *prima facie* obviousness when the asserted modification would change the principle operation of the prior art invention being modified.

At least for these reasons, Applicants submit that claim 1 patentably distinguishes over the asserted combination of *Yamada* in view of *Sekendur*. Independent claims 20, 22-25, and 27 define over this asserted combination based on similar reasoning. Each rejected dependent claim defines over the asserted combination of *Yamada* and *Sekendur* at least for depending from an allowable base claim.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102 based on *Yamada* and the rejection under 35 U.S.C. § 103 based on the asserted combination of *Yamada* in view of *Sekendur*.

2. § 102 Rejections Based on Yamada - Sekendur - Sato/Yamada - Montgomery/  
Yamada - Poole

Claims 11, 21, and 26 stand rejected under 35 U.S.C. § 103 as being unpatentable over *Yamada* in view of *Sekendur*, and further in view of *Sato et al.* (U.S. Patent 4,851,921); claim 15 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Yamada* in view of *Montgomery et al.* (U.S. Patent 4,797,544); and claim 19 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Yamada* in view of *Poole* (U.S. Patent 5,816,718). These rejections, insofar as they pertain to the presently pending claims, are respectfully traversed.

As set forth on pages 5-7 of the Office Action, the Examiner relies on the additional secondary references of *Sato*, *Montgomery*, and *Poole* as allegedly teaching certain incremental features of dependent claims. Applicants submit, however, that the Examiner's reliance on these references fails to make up for the deficiencies of the prior art discussed above with regard to the independent claims. Consequently, the asserted combination of references listed above (assuming these references are combinable, which Applicants do not admit) fails to establish *prima facie* obviousness of any pending claim.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the above-listed rejections under 35 U.S.C. § 103.

**CONCLUSION**

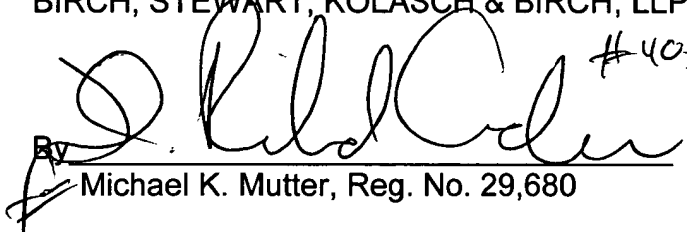
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact D. Richard Anderson (Reg. No. 40,439) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Applicants respectfully petition for a three (3) month extension of time pursuant to 37 C.F.R. §§ 1.17 and 1.136(a). A check in the amount of \$920.00 in payment of the extension of time fee is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

Claim 7 has been cancelled without prejudice or disclaimer of the subject matter contained therein.

The claims have been amended and/or reformatted as follows:

1. (Amended) An apparatus for printing graphical information on a surface, the apparatus comprising:

a print head for printing indicia on the surface;

an image sensor for recording an image of the surface, wherein the recorded image contains a position-coding pattern that identifies a position on the surface; and

a processor for converting the recorded image into a recorded position, wherein the recorded position is defined by two coordinate values, and

[wherein] the print head prints indicia on the surface based on a comparison of the recorded position with the graphical information to be printed.

4. (Amended) The apparatus of claim 3, wherein [further including:]

[a] said processor receives [for receiving] graphic information and converts [converting] the received graphic information into the plurality of graphics positions.

18. (Unamended) The apparatus of claim 17, wherein the nozzle dispenses dye in a plurality of directions.



19. (Unamended) The apparatus of claim 1, wherein the print head comprises a heater that prints the indicia by heating the surface.

20. (Amended) A system for printing graphic information on a surface having a position-coding pattern thereon, wherein an arbitrary subset of the position coding pattern defines a coordinate position on the surface, the system comprising:

a print head for printing indicia on the surface; and

an image sensor for recording an image of the surface,

wherein the print head prints indicia on the surface based on a comparison of the graphic information with the coordinate position defined by a position-coding pattern in the recorded image, the coordinate position being defined by two coordinate values.

21. (Unamended) The system of claim 20, further including a processor for determining a speed of the print head in relation to the surface, and wherein the processor terminates printing by the print head when the speed is changing in an amount greater than a predetermined acceleration threshold value.

22. (Amended) A method for printing graphic information on a surface, comprising:

accessing graphical information to be printed on the surface;

recording an image of the surface; and

printing indicia on the surface based on a comparison of a recorded position derived from the recorded image and the graphic information, wherein

the recorded position is defined by two coordinate values.

23. (Amended) An apparatus for printing graphical information on a surface, the apparatus comprising:

a nozzle for dispensing dye on the surface;

an image sensor for recording an image of the surface, wherein the recorded image contains a position-coding pattern that codes a position on the surface; and

a processor for converting the recorded image into a recorded position, wherein the processor determines a predicted position of the nozzle based on the recorded position, [and] wherein the nozzle dispenses dye on the surface when the predicted position corresponds to a graphics position in the graphical information, and wherein the recorded position is defined by two coordinate values.

24. (Amended) An apparatus for printing graphical information on a surface, the apparatus comprising:

a print head for printing indicia on the surface;

an image sensor for recording an image of the surface, wherein the recorded image contains a position-coding pattern that codes a position on the surface; and

a processor for converting the recorded image into a recorded position, wherein the processor determines a predicted position of the print head based on the recorded position, [and] wherein the print head prints the indicia on the surface when the predicted position corresponds to a graphics position in the graphical information, and wherein the recorded position is defined by two coordinate values.

25. (Amended) A system for printing graphical information, comprising:

a printing surface having a position-coding pattern thereon, wherein an arbitrary subset, having a predetermined size, of the position-coding pattern identifies a unique position on the printing surface, the unique position being defined by two coordinate values;

and

a printing unit for printing the graphic information on the printing surface, wherein the printing unit further includes:

a print head for printing indicia on the printing surface; and

an image sensor for recording an image of the arbitrary subset on the printing surface,

wherein the print head prints indicia on the surface based on a comparison of the identified unique position on the printing surface with the graphical information to be printed.

26. (Unamended) The system of claim 25, further including a processor for determining a speed of the print head in relation to the surface, and wherein the processor terminates printing by the print head when the speed is changing in an amount greater than a predetermined acceleration threshold value.

27. (Amended) A hand-held printing device configured to print as the device is moved over a surface upon which is recorded a pattern, the hand-held printing device comprising:

a housing configured to be held by a user;

a print head in the housing;

a sensor in the housing for reading the pattern;

a processor for determining, as the housing is moved over the surface, a location on the surface based on the pattern read by the sensor, and for causing the print head to print based upon the determined location, wherein the determined location is defined by two coordinate values.